July 29, 2014

BDCP Comments
Ryan Wulff, National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814
Via email to: BDCP.Comments@noaa.gov

Dear Mr. Wulff:

COMMENTS ON THE DRAFT BAY DELTA CONSERVATION PLAN, DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR THE BAY DELTA CONSERVATION PLAN AND THE IMPLEMENTING AGREEMENT FOR THE BAY DELTA CONSERVATION PLAN

The State Water Resources Control Board (State Water Board) and the Central Valley and San Francisco Bay Regional Water Quality Control Boards (Regional Water Boards) (collectively Water Boards) appreciate the opportunity to comment on the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Bay Delta Conservation Plan (BDCP), as well as the associated BDCP and the Implementing Agreement (IA) for the BDCP. A summary of our key comments is provided following our contact information below, and our detailed comments are provided in the attached table.

The mission of the Water Boards is to preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations. The State Water Board administers water rights in California including water rights for the Department of Water Resources' (DWR) State Water Project (SWP) and the U.S. Bureau of Reclamation's (USBR) Central Valley Project (CVP). The Water Boards also have primary authority over the protection of California's water quality. The BDCP will require both water right and water quality approvals from the Water Boards. Accordingly, the Water Boards are responsible agencies for the BDCP pursuant to the California Environmental Quality Act (CEQA). Specifically, activities that may require approval by the Water Boards include, changes to the SWP's and CVP's points of diversion of water and other provisions of their water rights, water quality certifications pursuant to Clean Water Act section 401, National Pollutant Discharge Elimination System permits, and potentially other water quality approvals.

In our role as responsible agencies the Water Boards previously reviewed and provided comments on the Notices of Preparation for the BDCP EIR/EIS and on the Second Administrative Draft of the EIR/EIS and the draft BDCP, as well as other written and oral input over the course of the BDCP process. To the extent that previous comments on the Second Administrative Draft EIR/EIS have not been fully addressed, they are incorporated by reference

in this comment letter. The Water Boards will continue to work with the BDCP lead agencies to determine how to address outstanding comments.

This letter provides comments on the December 2013 Draft EIR/EIS for the BDCP. Due to the interdependent and connected nature of the EIR/EIS, the BDCP, and the IA, this comment letter also provides limited comments on those documents as well. This comment letter does not reiterate all of the previous comments from the Water Boards that may not yet have been fully addressed, particularly in regards to Water Board approval and permitting related issues and information needs that may be outside the scope of the above documents. As discussed in the Water Boards' previous comment letter, additional information may be needed to support Water Board approvals beyond what is included in the above documents. Water Board staff will continue to work with DWR and other appropriate agencies on these issues. Further, due to the enormous size of the documents, the unprecedented complexity of the BDCP, the relatively short comment period considering the size and complexity of the BDCP, and the demands on staff resources due to the drought, we have focused our analysis on Alternative 4 (the preferred project), and to a lesser extent on Alternative 8 (the alternative requested by the State Water Board to provide a broad range of operational alternatives). Within our analysis of those two alternatives we generally further restricted our review to three areas. First, we reviewed the conceptual basis for the alternatives analysis in the EIR/EIS and the consistency and validity of the implementation of the conceptual basis in both the EIR/EIS and the BDCP. Second, we reviewed the models and analytical methods used for the Delta smelt and winter-run Chinook salmon analyses in BDCP Chapter 5, Effects Analysis, and in EIR/EIS Chapter 11, Fish and Aquatic Resources. Third, we reviewed the water quality and other sections of the EIR/EIS, IA, and BDCP that fall within the regulatory authority of the Water Boards.

We appreciate the extensive effort that went into preparation of the various BDCP documents. We also appreciate that the complexities and uncertainties associated with this project, given its large geographic scope and time horizon, which make it difficult to analyze the proposed project and the various alternatives. We nonetheless have general comments in the following topic areas:

- Analytical Methods
- Consideration of Uncertainty
- BDCP Decision Tree and Adaptive Management
- Reporting of Early vs. Long Term Analyses
- Modeling of Climate Change and Reservoir Operations
- Synthesis of BDCP Effects on Covered Fish
- Use and Representation of Data

As we have discussed in previous correspondence to DWR and other lead agencies, the Water Boards have specific statutory and regulatory responsibilities that are separate and distinct from the primary focus of the BDCP on ESA related issues that must be fulfilled in order for the BDCP to proceed. To meet those requirements, the Water Boards must independently consider whether and under what conditions to issue the various approvals needed for the BDCP, regardless of the provisions of the BDCP and its proposed processes.

Water Board staff are available to continue discussions regarding the process for considering the various approvals needed from the Water Boards for the project. If you have any questions concerning this matter, please contact me at diane.riddle@waterboards.ca.gov or

(916) 341-5297. Written correspondence should be addressed as follows: State Water Resources Control Board; Division of Water Rights; Attn: Diane Riddle; P.O. Box 2000; Sacramento, CA 95812.

Sincerely,

ORIGINAL SIGNED BY

Diane Riddle
Environmental Program Manager

Summary of Comments on the BDCP EIR/EIS, BDCP, and IA

Water Board Information Needs
The BDCP will require multiple water right and water quality approvals from the Water Boards that will take a year or more to process. To the extent the EIR/EIS will be used to support these approvals pursuant to CEQA, they should be clearly described, including the proposed changes to water right requirements for DWR and USBR. While not all of the project details the Water Boards will need to consider for various approvals need to be included in the EIR/EIS, that information must be provided to the Water Boards in a timely fashion to avoid delays. The Water Boards' comments on the Second Administrative Draft EIR/EIS address many of these issues in more detail. Water Board staff encourage the BDCP proponents to identify point staff familiar with Water Board permitting issues to coordinate with Water Board staff and identify what permits are needed by when and what additional information is required.

BDCP Analytical Method
Because of the complexity of the biological and physical factors considered within the BDCP, and the changes anticipated during its 50-year planning horizon, it is difficult to produce accurate and precise quantitative data that can be used to determine the magnitude and direction of the effects of the BDCP over its entire planning period. BDCP attempts to address this issue through qualitative modeling and adaptive management. Under the adaptive management process, qualitative results are converted into semi-quantitative results by updating the current knowledge that is used in the modeling scenarios over the duration of the 50-year planning horizon.

The distinction between qualitative planning and quantitative prediction is not, however, clearly identified in the BDCP and supporting EIR/EIS. The numerous model results reported in the BDCP and the EIR/EIS comprise a suite of hypothetical futures in which specified alternative conveyance construction, water operations, and habitat restoration scenarios are compared. According to the modeling appendices of the BDCP and the EIR/EIS, the majority of the model results can only be appropriately compared qualitatively at monthly time steps. This limitation is often violated in both the BDCP and the EIR/EIS. The explicit caution that it is only appropriate to use model results for planning and scenario analyses is stated in the technical appendices for the BDCP and the EIR/EIS, and not in the BDCP effects analysis and in the EIR/EIS alternatives analysis. To address this issue, the caution should be clearly stated and appropriately adhered to throughout the analyses.

Consideration of Uncertainty
Significant negative impacts tend to be discounted and positive results tend to be inflated in the EIR/EIS and the BDCP. The assumed effectiveness of various conservation measures, for example, appear to be overly optimistic, especially with regard to the effectiveness of habitat restoration, where it is assumed that habitat restoration will be 100 percent effective. This overly optimistic assumption is frequently used to offset impacts from water operations associated with Conservation Measure (CM) 1 (the new conveyance facility) and to support a potentially over-constrained range of operations for the protection of covered species under CM1. To address this issue, it would be appropriate to assume a more realistic rate of success for conservation measures and a wider range of adaptive management provisions, such as for Delta Outflows.

BDCP Decision Tree and Adaptive Management
The general structure of the BDCP decision tree and adaptive management processes have been described in the documents but the details for how the adaptive management provisions will be implemented are not provided, and are instead proposed to be developed in the future by the Implementation Office and the Adaptive Management Team. Further, those provisions are assumed to be adequate without provisions for contingency plans or specific thresholds for actions. It is therefore difficult to determine whether the measures will have the expected results or be adequate to reasonably protect beneficial uses of water and the public trust. Further, the range for adaptive management may be overly constrained given the high degree of uncertainty regarding the effectiveness of the conservation measures.

Reporting of Early vs. Long Term Analyses
A single comparison of the BDCP effects at the Late Long Term (LLT) analysis point (Alternative 4 vs. the No Action Alternative (NAA) for example) may not accurately describe the potential effects of the BDCP on covered fish. For example, the BDCP Appendix 5C.5.2-60 concludes that the negative effect of the BDCP in the Early Long Term (ELT) on spawning weighted usable area for winter-run Chinook salmon would be rendered moot by the late long term due to climate change driven reductions in the population size of winter-run Chinook. Similarly, in the analysis of the IOS model effects on winter-run Chinook, it was determined that the model results were sensitive to water-year starting conditions, with dry starting conditions leading to lower levels of escapement for decades under the BDCP while wetter starting years would have resulted in the BDCP providing a benefit (BDCP Appendix 5.G-81, line 37). In both cases, the BDCP has significant short term negative effects on winter-run Chinook that could significantly reduce the size of its single population and render it more susceptible to extinction long before the effects of climate change could affect the population at the LLT analysis point.

Except for some analyses conducted during the development of the BDCP Effects Analysis, model results for the ELT analysis point are not reported. For the purposes of determining the impacts of the new conveyance facility, the effects of the project at the ELT point are important to understand, especially since the Water Boards will not necessarily be considering the 50 year Endangered Species Act (ESA) related approvals that the fisheries agencies will be considering. Further, to differentiate between the effects of the project and other confounding and uncertain effects like climate change, ELT results should be reported. The 50 year time frame for the LLT analyses may mask significant effects of the project. These effects are important to understand given the high degree of uncertainty with future conditions, including climate change.

CEQA and NEPA Baselines in section 4.2.1.1 of the EIR/EIS explicitly recognize the requirement for consideration of both short-term and long-term impacts of the proposed project, and include quotes from Neighbors for Smart Rail v. Exposition Metro Line Construction 10 Authority (2013) 57 Cal.4th 439 (Smart Rail):

> For example, "[e]ven when a project is intended and expected to improve conditions in the long term—20 or 30 years after an EIR is prepared—decision makers and members of the public are entitled under CEQA to know the short- and medium-term environmental costs of achieving that desirable improvement." (Ibid.) Further, "[a]n EIR stating that in 20 or 30 years the project will improve the environment, but neglecting, without justification, to provide any evaluation of the project's impacts in the meantime does not 'giv[e] due consideration to both the short-term and long-term effects' of the project … and does not serve CEQA's

> informational purpose well." (Ibid., quoting CEQA Guidelines, § 15126.2, subd. (a).)

While the EIR/EIS states that its use of the Existing Conditions as the CEQA baseline is consistent with the Smart Rail decision, use of the differencing method of comparing the baseline as of the date of the Notice of Preparation against alternative effects more than 50-years distant, prevents any short-term analysis of the effects of the project.

Modeling of Climate Change and Reservoir Operations

While explicitly recognizing that climate change will affect the BDCP as well as the operations of the upstream reservoirs such as Shasta and Oroville, the BDCP does not provide a corresponding range of adaptive changes in reservoir operations under climate change. Not considering adaptive reservoir operations responses to climate change confounds the impacts assessment and comparison of alternatives, and may result in over or understatement of impacts that could be attributable to reservoir reoperations, including the NAA. Comparing alternatives to the NAA is one way to distinguish climate change effects from project effects. However, if climate change impacts are overstated, comparisons between a proposed alternative and the NAA may exaggerate the positive benefits of an alternative. Similarly, impacts that may be addressed by reservoir reoperations may be overstated. In addition, if an alternative is shown to have an erroneous positive or null effect then it may be excluded from necessary adaptive management and mitigation. To address these issues, sensitivity results could be provided. For example, reservoir reoperations could be included in the climate change analyses or the analyses could be presented without either climate change or water operational changes. The second option would provide a clearer distinction of project effects versus erroneous conclusions resulting from climate change assumptions.

Synthesis of BDCP Effects on Covered Fish

The EIR/EIS does not provide an explicit analytical framework for synthesizing the individual effects conclusions for each covered fish into a coherent statement describing the overall effect of BDCP on each covered fish. We recognize that given the large number of sometimes contradictory results considered for each covered fish that this is a difficult task. However, relying exclusively on professional opinion without specifying critical biological thresholds or how the various results contributed to the expert opinion provides little useful information for evaluating the adequacy of the opinion and the impacts assessment. The BDCP explicitly recognizes this approach but seems to misstate the transparency of the analysis (5.2.7.10, Page 5.2-27).

Use and Representation of Data

The BDCP effects analysis converts qualitative data to quantitative data (page 5.5-1, line 20), and then performs mathematical operations on the numerical codes for the ranked data as if the coded scores were quantitative ratio scale data. Because there is no method to determine if the intervals between ranks are constant, it is mathematically incorrect to perform addition, subtraction, multiplication, etc. on the numerically coded scores. The subsequent "transformation" of the scores back to a "qualitative scale" demonstrates that the intervals between ranks are not constant, as the very low to low rank interval is one unit while the rank interval from high to very high is seven units. These re-ranked results are then used to generate "net effect" tables (see Figure 5.5.1-5 for an example) that are the foundation of the BDCP effects analysis and, presumably, the professional judgment that forms the basis of the impact assessment conclusions in the EIR/EIS alternatives analyses.

The Delta Independent Science Board (ISB) came to a similar conclusion. The ISB also described how the improper use of qualitative data compounds the uncertainty inherent in attributing importance among multiple attributes of the covered fish and their habitat (Page B-43). The ISB also described the multiple sources of uncertainty present in both documents and recommended that “uncertainty and the many underlying assumptions be dealt with upfront, forcefully, and directly”. Even with perfect data, in the execution of scenario analyses it is expected and desirable that different models produce different results, and that some may show negative impacts while others may not. This situation is described as uncertainty in both documents, and in the effects and impacts analyses is postponed as an issue for the adaptive management program to resolve. No method is provided to determine how this will be addressed when the adaptive management process must consider multiple models and conflicting results.

Table 1

Detailed Comments and Recommendations

EIR/EIS General Comments

	Chapter/ Appendix	Page/Line # or Section	Comment
1	General	General	The EIR/EIS relies on a large number of sometimes unclearly labeled and numbered EIR/EIS appendices, the BDCP and its appendices, and primary source documents to support its methods and results. This reliance on a suite of documents produced at different times appears to have caused inconsistencies and errors in the documents and makes it difficult to verify which methods were used for analyses. Additionally, chains of references from the EIR/EIS to its appendices and then to the BDCP and its appendices sometimes lead to dead ends that provide no relevant information. These issues should be addressed.
2	General	General	The EIR/EIS and BDCP appear to assume that natural community restoration will be 100 percent successful. This is highly optimistic given the current status of the science regarding this issue. Is there an assumption of a success rate for any of the restoration projects? If so, please provide that assumption and detailed support for it. If not, a discussion of the success rate among restoration projects for each of the natural communities is appropriate for providing the reader an understanding of the potential for restoration to be successful and reduce impacts.
3	General	General	There is no explicit analytical framework for synthesizing the individual effects conclusions for each covered fish into a statement describing the overall effect of BDCP on each covered fish making it difficult to confirm the validity of the impacts determinations. The presentation of the conclusions is arranged by tunnel construction related impacts and by conservation measure. A series of individual life stage analyses specific to each covered fish is nested within the construction/conservation measure organization. Nested within each life stage analysis are multiple analyses that are supported using different model runs. Interpretations of each model result and effect

			conclusions follow the results. A summary table then lists the conclusion for each of the life stages. However, there is no explicit synthesis and explanation to support the overall CEQA and NEPA conclusions of the effect of BDCP on a particular covered fish. There is generally only a statement that all impacts considered in total were deemed to be a significant impact or a less than significant impact. This approach is described in the BDCP Effects analysis 5.2.7.10, Page 5.2-27, Line 36 as: "The net effects analysis assumes that **there is no overarching analytical framework** [emphasis added] that integrates all effects and derives a quantitative estimate of the overall effect of the BDCP. Instead, the BDCP effects analysis is designed to provide a transparent, systematic, and comprehensive process for combining results from quantitative and qualitative analyses. This process is described below. **The conclusions represent qualitative judgments** [emphasis added] of the effects of the BDCP that are grounded in the detailed quantitative and qualitative analyses in the appendices."
4	General	General	The use of model results sometimes appears to deviate from the stated limitations for their use (Section 4.3 Overview of Tools, Analytical Methods, and Applications, page 4-13) (See also EIR/EIS Appendix 5A-C5): "The models were used to compare and contrast the effects among various operating scenarios. The models incorporated a set of base assumptions; the assumptions were then modified to reflect the operations associated with each of the alternatives. The output of the models is used to show the comparative difference in the conditions among the different alternative scenarios. The model output does not predict absolute conditions in the future; rather, the output is intended to show what type of changes would occur. This type of model is described as comparative rather than predictive. Because of the comparative nature of these models, these results are best interpreted using various statistical measures such as long-term and year-type averages and probability of exceedance. Additionally, results from one model cannot be quantitatively compared to results from another model; therefore, comparisons between alternatives must be based on results that are derived from a consistent modeling approach." If the appropriate use of model results is as stated then the use of those results should be limited to the evaluation of relatively coarse metrics for purposes of ranking and

			selecting alternative scenarios. However, in the EIR/EIS the coarse scale results were incorporated into models with daily to hourly time steps to generate predictive results such as daily temperature thresholds. The appropriateness of these numerical comparisons should be clearly explained.
5	General	General	When multiple models are run to analyze the same impact, such as water temperature below Keswick, it is expected that the models will produce different results and that some may show negative impacts while others may not. This uncertainty in the analysis is proposed to be addressed through the adaptive management plan. However, the adaptive management plan is not fully developed and as such it is difficult to determine whether it will be adequate to address potential impacts as proposed.
6	General	General	For the purposes of informing potential changes to water rights and water quality approvals needed for construction of the project in the near term, the EIR/EIS should include an analysis of all of the ELT operational and construction related effects of the project. The LLT analysis point represents the end of the term of the requested take permits and while relevant for producing an estimate of take during the period of the permits may not adequately inform the Water Board's decision making processes.
7	General	General	There are 9 flow requirements and 6 of those have potential Real Time Operations (RTO) restrictions (BDCP Chapter 3.4.1.4.3): • OMR flows RTO • HORB RTO • Delta outflow/X2 • North Delta bypass flow RTO • E:I • Sac River at Rio Vista flow • DCC RTO • Suisun Marsh Salinity Gates • Fremont Weir RTO There are several factors that could be considered in the RTO process including: • Covered fish species risks • Actions to avoid adverse effects on covered fish • Allocations in year of action or future years

			• End of water year storage • San Luis Reservoir low point • Delivery schedules for any SWP or CVP contractor • Actions that could be implemented throughout the year to recover any water supplies reduced by actions taken by the RTO team. • Obligations to meet the SWRCB water quality standards • Will take into account upstream operational constraints such as coldwater pool management, instream flow, and temperature requirements. As of the date of the Public Drafts of the BDCP and EIR/EIS no agreement had been reached concerning how RTOs will affect the BDCP flow related requirements. These requirements are relied upon in the EIR/EIS to reduce impacts to less than significant levels. However, it is unclear whether the RTOs will be adequate until they have been fully developed and reviewed, especially given that the considerations for RTOs may have mutually exclusive purposes.
8	General	General	The tables in EIR/EIS Appendix 5A, Section C should be clarified. The data in the tables is arranged in the format required to plot cumulative frequencies of monthly data but the implied cell by cell analysis of the data as presented in the tables appears to be in conflict with the appropriate use of the data described in EIR/EIS Appendix 5A.4.6, page A31. In contrast, the associated figures all present cumulative frequencies of long-term monthly data. This issue also appears elsewhere, including EIR/EIS Appendix 11C, page 11C-218, Table 1, Mean Monthly Flows (cfs) for Model Scenarios in the Sacramento River at Keswick. A table that appears to illustrates the appropriate use of the data is shown on page 11C-220, Table 2, Differences (Percent Differences) between pairs of Model Scenarios in the Sacramento River at Keswick, Year-Round which shows differences between alternatives across the long-term data and across water-year data.
9	General	General	As indicated in several comment letters on the BDCP environmental review process, for the Water Boards to consider any water quality and water rights applications or petitions for the BDCP, environmental documentation prepared for the project must disclose the significant effects of the proposed project and identify a

			reasonable range of interim and long-term alternatives that would reduce or avoid the potential significant environmental effects. The BDCP does not appear to propose interim water project operational measures needed to protect fish and wildlife beneficial uses beyond those requirements associated with biological opinions. The measures required by the biological opinions are designed to avoid jeopardy of listed species which is not the same standard as the standard of reasonable protection of beneficial uses. Since the State Water Board is required by law to periodically review and update, as appropriate, the Bay-Delta Plan, it will continue its independent review and update of the Bay-Delta Plan, and will establish requirements during the interim that are based on the best available science at the time of the update. The Water Boards will also need to independently evaluate the long-term measures proposed by BDCP and reach an independent conclusion on whether to approve changes associated with the project.
10	General	General	The Alternative 4 Decision Tree for Delta outflow includes four operational scenarios. Compared to the No Action Alternative (NAA), these operational scenarios decrease total Delta outflow in the late-long term with some exceptions for critical water-years and for below normal, dry and critical water-years for the H4 high outflow scenario (EIR/EIS Appendix 5A.C.7). The justification for this limited range of Delta outflow scenarios is not clear given that there is significant information supporting the need for more Delta outflow for the protection of aquatic resources and the substantial uncertainty that other conservation measures will be effective in reducing the need for Delta outflow. For this reason a broader range of Delta outflows should be considered for the preferred project. Regardless of the BDCP proposed project, the State Water Board may establish higher Delta outflow requirements in the future and may allocate responsibility for those flows differently than proposed in the BDCP.
11	General	General	The geographical scope of the BDCP impacts assessment excludes San Pablo and San Francisco

			Bays from the analysis. CEQA requires the evaluation of impacts to the affected environment regardless of the scope of the project. The impacts assessment should both evaluate potential impacts downstream of the Delta and propose appropriate monitoring and mitigation to address those impacts. Specifically, the EIR/EIS should evaluate project effects on water quality and the various beneficial uses of water in the Bay area, including effects on adadromous and other fish species.

EIR/EIS Specific Comments

	Chapter/ Appendix	Page/Line # or Section	Comment
12	EIR/EIS 3	4.14.2 (page 3.4-88, lines 1-14), 4.14.4 (page 3.4-290,lines 19-33) 6.3.3 (pages 3-155 to 3-157)	While the EIR/EIS states that CM1 will not substantially change dissolved oxygen levels in the Delta, CM1 will periodically increase the load of oxidizable material entering the Stockton Deep Water Ship Channel (DWSC) from the upper San Joaquin Basin. The increased load will occur when the project is diverting most of its water from the North Delta while allowing San Joaquin River flows to enter the South Delta through the DWSC. This increased load of organic material may reduce the assimilative capacity of the DWSC and cause a depression of water dissolved oxygen levels that may be greater than the capacity of the existing aeration facility to reoxygenate. The BDCP includes CM14 (Stockton Deep Water Ship Channel Dissolved Oxygen Levels). The purpose of CM14 is to ensure continued funding for and operation of the aeration facility and to improve the facility's effectiveness in meeting the BDCP's biological goals and objectives and DO TMDL objectives. The BDCP will share in funding the long-term operation and maintenance costs associated with operation of the aeration facility. The BDCP recognizes the current limitations of the existing aeration facility to provide sufficient oxygen at all times and places. If oxygen levels fall below the Water Quality Objective after implementation of CM1 potential causes of noncompliance will be evaluated and the means to achieve compliance identified. BDCP states that it <u>will consider</u> funding modifications to the Aeration Facility and/or construction of additional aeration facilities to increase DO levels in the DWSC.

			The BDCP should explicitly identify whether it will fully mitigate this impact or whether full mitigation is not feasible and why.
13	EIR/EIS 8	8.2.1.7	The EIR/EIS/S does not clearly state that Suisun Marsh wetlands are listed on the 2010 303(d) list as impaired for low DO/organic enrichment, mercury, nutrients and salinity. Potential impacts related to dissolved oxygen conditions, nutrient concentrations and mercury levels are not fully considered in the document. Only effects of changes in salinity levels are considered in detail. Please include this information in the document, including appropriate monitoring and mitigation.
14	EIR/EIS 8	8-423 & 8-436	The EIR/EIS concludes that preferred Alternative 4 may cause unavoidable adverse impacts to chloride and electrical conductivity (EC) levels in the Delta and Suisun Marsh which will increase the frequency of violations of DWR's and USBR's water right permit and license conditions to meet water quality objectives included in State Water Board Decision 1641 (D-1641). The EIR/EIS states that these impacts may be detrimental to municipal, agricultural, and fish and wildlife beneficial uses of the water. DWR and USBR must comply with their water right permits and license or pursue a change in those requirements. Changes to permit and license requirements to implement water quality objectives may also require changes to the Bay-Delta Water Quality Control Plan (Bay-Delta Plan). Change to the Bay-Delta Plan will require substantial support to demonstrate reasonable protection of beneficial uses. Changes to water right requirements will require support to indicate that there will not be impacts to other legal users of water or unreasonable effect on fish and wildlife before any such changes will be considered.
15	EIR/EIS 8	8.4.3.9 (pages 475-476) 8.4.3.15 (pages 692-693	The EIR/EIS indicates that quantitative modeling for CM1 Alternative 4 water operations would have little to no effect on selenium concentrations in water and in fish tissues in Delta channels. In contrast, similar modeling for CM1 Alternative 8 shows that there may be an increase in selenium concentrations in fish in the western Delta. BDCP proposes to validate their bioaccumulation model with site specific monitoring if CM1 Alternative 8 is selected.

			Selenium cycling in the Delta is complicated and insufficiently well understood to accurately model concentrations in water and in fish under any of the CM1 alternatives. Monitoring and assessment of selenium fish tissue concentrations in the Delta should be conducted after implementation of CM1, regardless of the alternative selected to better understand actual project effects and associated mitigation, adaptive management and regulatory activities by the Water Boards and others.
16	EIR/EIS Chapter 8	8.2.3.15	The EIS/EIR defines the existing conditions in the Sacramento River based on mean selenium concentrations at Knights Landing of 0.32 µg/L, which are much higher than the concentrations found downstream at Freeport (mean<0.1 µg/L). Similarly, the existing conditions in San Francisco Bay were assumed to be higher (0.21 to 0.31 µg/L at Mallard Island) than the observed concentrations across multiple sampling events in Suisun Bay (0.08-0.12 µg/L). As a result, it appears that the EIR/EIS overestimates baseline selenium conditions which as a result may under estimate the effects of the alternatives when compared to this overestimated baseline condition. Depending on the hydrological conditions, it actually appears that the preferred alternative may result in increases in water column selenium concentrations by 8 to 20 percent compared to the change estimated in the EIS/EIR of 1 to 2 percent. This issue should be clarified in the EIR/EIS. In addition, as discussed above, regular monitoring of the system should be conducted to better understand actual project effects and associated mitigation, adaptive management and regulatory activities by the Water Boards and others.
17	EIR/EIS Chapters 8 and 31	8.4.3.9 (pages 445-446), 8.4.3.15 (pages 673-674) Table 31.1	Table 31.1 of the EIR/EIS lists the projected increase in mercury in fish as a significant and unavoidable adverse impact of restoring wetlands under Alternative 4. Similar conclusions were reached for Alternative 8. The BDCP proposes to mitigate mercury impacts under all alternatives by implementing CM12 (Methyl Mercury Management) which it states will minimize the increased mobilization of methyl mercury at restoration areas. CM12 will employ pre-design characterization, design elements, and best management practices to mitigate methylation of mercury, and will require the monitoring and reporting of observed methyl mercury levels. The BDCP notes that the effectiveness of CM12 will be

			enhanced by employing best management practices developed by the Phase I Methyl Mercury TMDL Control Studies. CM12 identifies restoration actions in the Yolo Bypass and the Cosumnes-Mokelumne areas of the Delta as having the greatest potential for methyl mercury generation. The inorganic mercury content of sediment is an important factor contributing to methyl mercury production. Some of the highest sediment mercury concentrations are in Cache Creek and downstream in the Yolo Bypass. This is because the Cache Creek watershed exports about half of all the mercury entering the Delta. Half of this load is trapped in the Cache Creek Settling Basin while the rest is exported to the Yolo Bypass. Decreasing this inorganic mercury load will reduce methyl mercury production in restored wetlands in the Yolo Bypass. The Cache Creek Settling Basin is owned and operated by DWR and by the U.S. Army Corp of Engineers. The Methyl Mercury Basin Plan Amendment calls for DWR and others to develop and implement a plan for improving the mercury trapping efficiency of the Cache Creek Settling Basin. CM12 should ensure these improvements are carried out. If fully implemented, the BDCP conservation measures will increase wetland acreage by about fourfold in the Delta, from 20,000 to 80,000-acres. Wetlands have high methyl mercury production efficiency and the increased acreage may increase fish tissue concentrations in the Delta by up to 50-percent. The BDCP can do more to minimize projected mercury increases in fish tissue concentrations than what is proposed in CM12. The BDCP should commit to funding improvements in the Cache Creek Settling Basin to reduce loads of inorganic mercury entering the Yolo Bypass. It should also commit to providing funding for the Phase I Basin Plan Amendment mercury control studies so that best management practices will be understood when restoration areas are developed under CM12.
18	EIR/EIS 8	8.4.3.9 (pages 432-434), 8.4.3.15	Chapter 4 of BDCP states that the annual installation, operation and removal of the temporary South Delta barriers in Middle and Old rivers, Grantline Canal, and at the Head of Old River will continue as part of CM1.

		(pages 666-667)	However, the temporary barriers program is not evaluated under any of the CM1 alternatives. Implementation of any CM1 alternative will fundamentally change the flow of water in the South Delta, which can change the impacts of the temporary barriers. Old and Middle rivers are on the CWA 303(d)-list for low dissolved oxygen. DWR currently monitors water quality conditions in the South Delta as a requirement under its 401 Water Quality Certification for the South Delta Temporary Barriers Program. If the BDCP will continue to use the temporary barriers under any of the alternatives in CM1, then the use of the barriers should be explicitly evaluated in the various CM1 alternatives. In addition, the BDCP should provide for continued water quality monitoring to understand the effects of the barriers in the context of the BDCP in addition to any appropriate mitigation to address impacts of the barriers in the context of the BDCP, including impacts to dissolved oxygen levels.
19	EIR/EIS 11	2 Line 16	The EIR/EIS states: “The methods used to analyze impacts to covered and non-covered fish and aquatic species in Chapter 11 rely on the models and data included in the Effects Analysis. Chapter 11 references specific sections of the Effects Analysis, including Appendix 5.B, Entrainment; Appendix 5.C, Flow, Passage, Salinity, and Turbidity; Appendix 5.D, Contaminants; Appendix 5.E, Habitat Restoration; and Appendix 5.F, Biological Stressors on Covered Fish.” In general, the EIR/EIS states that the BDCP is incorporated by reference and there are many statements describing which BDCP models are included such as BDCP Chapter 4, pages 4-8. Given the stated integration of the two documents, why are some model results such as those for IOS and OBAN selectively excluded from the EIR/EIS analysis? Additionally, why are the results of the BDCP net effects analysis not explicitly incorporated into the EIR/EIS?
20	EIR/EIS 11	186 Line 1	Table 11-4. How is abundance defined with respect to the legend provided at the bottom of the table? Delta smelt currently are a low abundance species throughout the Delta. It appears that this is a risk assessment and not a reference to a numerical abundance value. How were the probability of occurrence and the abundance if present both determined and weighed for their relative contribution to risk?

21	EIR/EIS 11	186 Line 1	Table 11-4 appears to have contradictory statements regarding the presence of covered fish at construction sites during the June 1 - October 31 in-water construction period. In the body of the table the white cells have included text that states the species life stage is "Not Present" while the legend at the bottom of the table states that the white cells indicate "unsure if present". Also, the statements in the alternatives text appears to conflict with both statements in the table. For example, on page 11-287, line 7 states that: "Longfin smelt are not expected to be present in the project construction zones during the expected in-water construction window (June1-October 31) (see Table 11-4)". Please address these issues.
22	EIR/EIS 11	203 Line 26	Both SacEFT and SALMOD were used for analyzing Impact AQUA-41 but only SacEFT is included in the list of models used in the analysis. Please explain why or provide both sets of results?
23	EIR/EIS 11	239 Line 38	Impact Aqua-1. What is the justification for the statement with respect to Delta smelt and temporary turbidity generated by construction activities that: "[a}ny exposure would not be adverse because of their preference for turbid condition…"(page 11-239). Why are local areas of artificially generated turbidity considered to be equal in effect to naturally generated turbidity? There are a number of physical and biological processes that are involved that are very different between the two sources of turbidity and it seems very unlikely that the turbidity generated by each of the two sources is equivalent. Turbidity is a measure of light extinction in the water column and not a direct measure of the processes that cause reduced light levels in water. These distinctions are noted on page 11-239, lines 13-16. Additionally, since it is acknowledged that the sediment generated during these activities is likely to release toxic substances, what is the basis for the statement that the temporary increase in turbidity would have no effect? Turbidity is an indirect measure of suspended sediment properties and the suspended sediment is likely to contain toxic substances.
24	EIR/EIS 11	1290 Line 36	Impact Aqua-1. What is the justification for the statement with respect to Delta smelt and temporary turbidity generated by construction activities that: "delta and longfin smelt have evolved and adapted to life in turbid waters...so increases in turbidity are expected to generally improve habitat conditions for these

			species"(page 11-239). Why are local areas of artificially generated turbidity considered to be equal in effect to naturally generated turbidity? There are a number of physical and biological processes that are involved that are very different between the two sources of turbidity and it seems very unlikely that the types of turbidity generated by the two sources are equivalent. Turbidity is a measure of light extinction in the water column and not a direct measure of the processes that cause reduced light levels in water. These distinctions are noted on page 11-239, lines 13-16.
25	EIR/EIS 11	1291 Line 24	Impact Aqua 2.See above comments for Aqua 1. Please address this issue.
26	EIR/EIS 11	1293 Line 7	Impact Aqua-3. There is some evidence that Delta smelt spawn over sandy substrate (EIR/EIS Appendix A, 11A-9, line 10). Given that significant amounts of sediment will be attracted to the North Delta Diversion (NDD) pumps during high sediment periods after initial pulse flows, that coarser sediment materials such as sand move as bed-load, that the NDD will cause local changes in hydrological energy gradients, that there will be dredging of sediment (upstream, downstream, and midstream) near each NDD pump, it seems reasonable to assume that deposition of sand will occur near the NDDs. This sandy substrate could potentially attract spawning Delta smelt and subject larvae to entrainment. Please explain how this potential issue being addressed.
27	EIR/EIS 11	1295 Line 24	Impact Aqua-4. This impact for Alternative 4 was determined to have a potentially significant impact on Delta smelt spawning and egg incubation habitat but concluded that the potential impacts would be offset by habitat restoration because the Habitat Suitability Index "in each subregion of the Plan Area is appreciably greater under the BDCP than under Existing Conditions" (note that this was the NEPA conclusion so the term "existing conditions" is assumed to be a typographical error and NAA was assumed to be the intended baseline). However, BDCP Appendix 5E, page 5.E-95, line 27 with respect to the Cache Slough subregion states: "It is unclear from this analysis if the overall increase in HUs [(Habitat Unit)] as a result of CM4 compensates for the decline in habitat suitability related to increasing temperatures for spawning delta smelt in Cache Slough." This seems to imply that climate change may render any habitat restoration ineffective so that

			habitat restoration may not fully mitigate for the negative impacts found under Impacts Aqua-4, especially given that the Cache Slough subregion is one of the two most important restoration areas for Delta Smelt a. This analysis stated that it was conducted in the same manner as that for Impact Aqua-4 for Alternative 1A, however, the analysis under Alternative 1A appear to have been based on a different set of analytical tools and as such its conclusions may not be directly applicable to Alternative 4. Please address this issue.
28	EIR/EIS 11	1295 Line 25	The results of BDCP Appendix 5E are cited to support the Habitat Suitability Index (HSI) and Habitat Unit (HU) approaches used in the EIR/EIS assessment. The methods described in BDCP Appendix 5E state that three physical parameters were included in the HSI but that turbidity could not be modeled and was held constant between scenarios and water-year type (page 5.E-72, line 10). Holding turbidity constant across the comparisons effectively eliminated it from the model as indicated in Figures 5.E.4-40 through 5.E.4-40. The same paragraph states that there were very small differences in temperature and concludes that the driving variable was salinity. Given that the subregions can be divided into brackish or fresh water habitat and the fresh water habitat never becomes brackish, the HSI analysis reduces to the effects of operations on salinity in the brackish region. On page 5.E-38, line 39 the methods state that monthly salinity was used for DCM2 stations within each subregion. Please explain how are average monthly salinity results relevant to evaluating the quality of habitat for Delta smelt? How are these results useful for rating habitat quality within a freshwater subregion such as Cache Slough where there is a resident population of Delta smelt?
29	EIR/EIS 11	1295 Line 38	Impact Aqua-5: The discussion states that the abiotic habitat methods are detailed in BDCP Appendix 5C.5.4.5.1. However, that section provides only results and not detailed methods and refers the reader to Feyrer and coauthors (2011) for method details. In referring to that paper it is not clear which of their detailed methods were actually used in the effects analysis and in the EIR/EIS. Please clarify.
30	EIR/EIS 11	1298 Line 15	Why are differences reported in hectares instead of acres? The remainder of both the BDCP and the EIR/EIS reports area in acres.

31	EIR/EIS 11	1301 Line 5	Impact Aqua-19. What is the justification for the statement with respect to longfin smelt and temporary turbidity generated by construction activities that longfin smelt: "are unlikely to be adversely affected by temporary increases in turbidity"(page 11-287). Why are local areas of artificially generated turbidity considered to be equal in effect to naturally generated turbidity? There are a number of physical and biological processes that are involved that are very different between the two sources of turbidity and it seems very unlikely that the types of turbidity generated by the two sources are equivalent. Turbidity is a measure of light extinction in the water column and not a direct measure of the processes that cause reduced light levels in water. These distinctions are noted in the delta smelt Impact Aqua 1 discussion on page 11-239, lines 13-16 which is specifically referenced in longfin smelt Impacts Aqua 19.
32	EIR/EIS 11	1315 Line 15	Impact Aqua-40. Summary. The EIR/EIS states that the effects of Alternative 4 on spawning and egg incubation habitat for winter-run Chinook salmon are uncertain. What criteria will be used by the BDCP to select one model result over the alternative results?
33	EIR/EIS 11	1315 Line 21	Impact Aqua-40. Flow. The brief summary of the effect of Alt 4 H3 vs the NAA on Sacramento River flow at Keswick Dam for winter-run Chinook ESU spawning and egg incubation habitat concludes that scenario H3 generally provides a benefit by increasing flows in May and June and results in no effects in later months. However, the results cited as supporting the summary statement (EIR/EIS Appendix 11C.4.1.1, Table 2, pages 220-222) indicate complex water-year dependent results for July through September that include no difference, a substantial number of decreases, and two increases. Please clarify.
34	EIR/EIS 11	1316 Line 9	Impact Aqua-40. Exceedence days. The methods for calculating the exceedence frequency are not clear. Additionally, it appears that the mathematical operations in Table 11-4-15 may be incorrect. For example, if we assume a hypothetical example with a score for the NAA of 41 days out of 150 and a score for scenario H3 of 38 days out of 100 then the "divide-by-zero" rule cannot be violated as you do not subtract 41-38 to get -3 and 150-150 to get 0 and then divide -3 by 0. Please clarify.

35	EIR/EIS 11	1317 Line 9	Impact Aqua-40. It appears that the results of Table 11-4-16 contradict those of Table 11-4-15 when they are compared using all of the water-years for a particular month. Please clarify.
36	EIR/EIS 11	1318 Line 5	Impact Aqua-40. Reclamation Egg Mortality Model. The methods and reporting values should be clarified in this section of the EIR/EIS and BDCP Appendix 5C.4. It is not clear if Table 11-4-17 is reporting daily mortality rates or annual mortality rates. It is also not clear how the daily time step data were used. Also, the statement that when the data are interpreted on an absolute scale that the increase in mortality would be negligible may not be true not based on a complete life cycle analysis. . A very small change in the rate of mortality could lead to a very large increase in the number of eggs killed.
37	EIR/EIS 11	1319 Line 4	Impact Aqua-40. SacEFT. The methods described for the SacEFT model are not clearly described making the results difficult to evaluate.
38	EIR/EIS 11	1319 Line 23	Impact Aqua-40. Scenario H1 vs. Scenario H3 and not NAA comparison. Generally, in the text of this section the results for Alternative 4 Scenario H1 were compared against Alternative 4 Scenario H3 instead of the NAA while the figures supporting the analysis provided the comparison with the NAA. While the text states that the effects of Scenario H1 were generally similar to those for Scenario H3 for May-September, Appendix 11C4.1.1 Table 2, page 222, indicates that Scenario H1 will have large flow effects in September of Wet and Above Normal water-years. Please clarify.
39	EIR/EIS 11	1321 Line 5	Impact Aqua-40. H3 vs. H4 and not NAA comparison. Generally, the text of this section compares the results for Alternative 4 Scenario H4 against Alternative 4 Scenario H3 instead of the NAA while the figures supporting the analysis provide the comparison with the NAA. Please address.
40	EIR/EIS 11	1322 Line 15	Impact Aqua-40. This analysis is based on the results of seven different model results: 1) Sacramento River flows; 2) Shasta Reservoir storage; 3) mean monthly water temperature; 4) days per month temperature exceedences; 5) total degree days; Reclamation Egg Mortality Model, and: 7) SacEFT. For Alternative 4 the CEQA conclusion is that the impacts are Less Than Significant while the NEPA effect is Not Determined. The basis for the Less Than Significant CEQA determination is not clear given that there was little

			correlation between the more general model results (Sacramento River flow, Shasta Reservoir storage, mean monthly water temperature) and the more specific model results. Additionally, it is not clear how the complex pattern of negative and beneficial effects under the more specific models assessed arrived at a Less Than Significant determination.
41	EIR/EIS 11	1326 Line 1	Impact Aqua-41. H3 Scenario. It appears that the analysis should have used a symmetrical period around the peak juvenile rearing period of August through January or explained why it chose an asymmetrical period of August through December (BDCP Appendix 5C.A, SacEFT attachment following table of references, Figure I.2, page 7). Additionally, this analysis of Scenario H3 does not clearly state which Sacramento River flow stations it is discussing ("upstream of Red Bluff") while the analysis of Scenario H1 appears to state that it is discussing the stations at Keswick and the Red Bluff Diversion Dam. Please address.
42	EIR/EIS 11	1326 Line 5	Impact Aqua-41. Flows. The analysis found that flows were up to 18 percent less than the NAA but concluded that the duration and magnitude of the reduction was not biologically significant without providing support for that determination. Please describe the standards used for this conclusion.
43	EIR/EIS 11	1326 Line 15	Impact Aqua-41. SacEFT Juvenile WUA for rearing. It is unclear from the descriptions of the methods exactly what the index represents (see SacEFT pages 59-60). Also, it is unclear what the basis is for the SacEFT determinations. Finally, the model was run with daily flow and temperature data from the SRWQM instead of the standard monthly time step. Using daily mortality data summed over a year as a quantitative result may violate the monthly time step rule stated in EIR/EIS Appendix 5A.4.6, page A31. Please address these issues.
44	EIR/EIS 11	1326 Line 17	Impact Aqua-41. SacEFT Juvenile Stranding Index. This index reflects the average proportion of habitat available on a particular day and is not a measure of the proportion of juveniles lost nor does it take into account the loss of total habitat area that would have occurred under ideal conditions (SacEFT pages 69-70). Please address.

45	EIR/EIS 11	1326 Line 22	Impact Aqua-41. There are no SALMOD data provided to evaluate the SALMOD results for winter-run Chinook smolt equivalent habitat-related mortality. Please provide such results. Also, both SALMOD and SacEFT use the same flow data downscaled from CALSIM monthly data to daily data as well as the same water temperature data from the SRWQM. The two models represent biological and physical processes differently so they should by design produce different results. What criteria will be used to select one model result over that of another model?
46	EIR/EIS 11	1326 Line 31	Impact Aqua-41. H1 Scenario. See H3 Scenario comments.
47	EIR/EIS 11	1327 Line 1	Impact Aqua-41. H4 Scenario. See H3 Scenario comments above.
48	EIR/EIS 11	2506 Line 3	In the NEPA and CEQA analyses, conclusions for Alternatives 4 and 8 appear to be treated differently with respect to a finding of significant effects of operations on spawning and egg incubation habitat. The Alternatives should be treated the same with respect to impacts assessments and potential adaptive management and mitigation. If adaptive management or other mitigation could be employed to avoid or reduce an impact, it should be proposed. Further, uncertainty should be treated consistently with the alternatives. For this analysis it appears that for CEQA purposes uncertainty for Alternative 4 yielded a less than significant impact and yielded a significant impact for Alternative 8. It appears that Alternative 8 impacts to spawning and egg incubation could be mitigated but that that mitigation would result in additional water supply impacts. This mitigation should have been proposed given the statement made under real-time operations in Chapter 3.4.1.4.5, page 3.4-27, line 36 that “operational decisions will take into account upstream operational constraints, such as coldwater pool management, instream flow, and temperature requirements.”
49	EIR/EIS Appendix 5A	A22	The example shown of daily variations in north of Delta diversions (NDD) and bypass flows is for a wet year with very high flows. It would be illustrative to show similar charts for other year-types, particularly dry and critical years.

50	EIR/EIS Appendix 5A	A23	The Appendix states that: "The CALSIM II simulations do not consider future climate change adaptation which may manage the SWP and CVP system in a different manner than today to reduce climate impacts. For example, future changes in reservoir flood control reservation to better accommodate a seasonally changing hydrograph may be considered under future programs, but are not considered under the BDCP. Thus, the CALSIM II BDCP results represent the risks to operations, water users, and the environment in the absence of dynamic adaptation for climate change." Because the CALSIM simulations don't consider operational adaptation to climate change, they may overstate or understate the impacts and benefits associated with the alternatives and may make it difficult to differentiate between uncertain climate change effects and the effects of the alternatives. It also makes it difficult to determine to what extent potential impacts may be mitigated. The uncertainty associated with this issue should be clearly addressed in each impact assessment for which this issue may apply.
51	EIR/EIS Appendix 5A	A28	The appendix states that: "Reservoir inflow temperatures were derived from the available record of observed data and averaged by month. The mean monthly inflow temperatures are then repeated for each study year." This assumption may lead to overestimating the amount of coldwater pool in warm or dry years.
52	EIR/EIS Appendix 5A	A46	The NDD diversions are modelled in 15 minute increments, and are set to only divert when downstream velocity is > 0.4 ft/sec. The graph on page 5A-A48 shows the NDD pumps being turned on and off on an hourly basis to meet this target. However, most pumps are not physically capable of that type of operations.
53	EIR/EIS Appendix 5A	B6 Line 22	The following statement is made beginning on Line 22: "SWP Banks pumping plant has an installed capacity of about 10,668 cfs (two units of 375 cfs, five units of 1,130 cfs, and four units of 1,067 cfs). The SWP water rights for diversions specify a maximum of 10,350 cfs, but the U. S. Army Corps' of Engineers (ACOE) permit for SWP Banks Pumping Plant allows a maximum pumping of 6,680 cfs. With additional diversions depending on Vernalis flows the total diversion can go up to 8,500 cfs during December 15th – March 15th. Additional capacity

			of 500 cfs (pumping limit up to 7,180 cfs) is allowed to reduce impact of NMFS BO Action 4.2.1 on SWP." The SWP water right permits for diversions at Banks authorize DWR to divert or redivert up to 10,350 cfs. From January 8, 1995, to February 6, 1995, diversions at the Banks pumping plant totaled 468,542 acre-feet at an average rate of 7,874 cfs, the largest amount taken during any 30-day period since the project was constructed. The permits have an expired "complete-use" date of December 31, 2009. As stated in our previous comments on the Second Administrative Draft EIR/EIS, DWR must file petitions to extend the "complete-use" date in its permits and the State Water Board must approve those petitions before additional use is authorized above the maximum amounts previously used. . DWR filed time extension petitions in 2009 to extend the permits to 2015. The petitions were publicly noticed and timely protested, but there has been no activity since the protests were received, including completion of necessary CEQA documentation to support the proposed change. This issue should be acknowledged in the EIR/EIS.
54	EIR/EIS Appendix 5A	B39 Line 34	The EIR/EIS states that "Stored water releases to meet the enhanced spring outflow requirement occurs only from Oroville, minimizing storage impacts to other reservoirs like Shasta and Folsom." It seems highly unlikely that all additional spring outflows would come from Oroville. This assumption should be discussed.
55	EIR/EIS Appendix 5A	B40 Line 7	Regarding the D-1641 export-inflow ratio the appendix states: "In the Alternative 4 scenarios H1 and H3, however, this requirement is applied to the south Delta exports only, and the NDD is not included in the Delta inflow or the Delta exports computation used to determine this requirement. Conversely, in the Alternative 4 scenarios H2 and H4, this requirement is applied to the total Delta exports by including the north Delta diversion in the Delta inflow and the Delta exports computation used to determine this requirement." This is inconsistent and makes the alternatives difficult to compare. To address this, a technical memorandum was prepared and included on page 5A-D149. The analysis re-ran scenarios H1 and H3 including the NDD in the E/I ratio and compared the results to the original model runs. Unfortunately, only a very small subset of the results were presented. The text states "the results

			from the sensitivity run for A4_ESO_ELT with E/I ratio approach recommended by NMFS showed that on a long-term average, there are minor changes in the flow and storage operations compared to the A4_ESO_ELT results included in the current effects analysis." However, the long-term average doesn't capture dry year effects or effects during specific months that may impact sensitive species. Without showing the full results of the study the analysis cannot be fully verified.
56	EIR/EIS Appendix 5A	B97	It is unclear what averaging period is proposed for the bypass flows on the Sacramento River. Will diversions be based on the monthly average flow, daily average flow, instantaneous flow, or some other metric? Without knowing what averaging period will be used it is not possible to assess the protectiveness of the proposed bypass flows. Flows at Freeport reverse occasionally at ebb tide under current conditions. If proposed tunnel diversions are based on an average flow rather than instantaneous flow, reverse flows at Freeport would likely become more common and more extreme in the period from July to November. Additionally, flows at Freeport upstream of the intakes are projected to decrease during that time period, as compared to existing conditions, which will exacerbate any potential reverse flow issue (Appendix 5A, page C-738). This issue should be addressed in the EIR/EIS and potential impacts mitigated.
57	EIR/EIS Appendix 5A	5A.C.1285	It is not clear if this graph is actually displaying salinity at Emmaton or if it is displaying salinity at Threemile Slough. Regardless, based on the model results, the chances of exceeding the D-1641 salinity standards at Emmaton increase dramatically. The chance of exceeding the 0.45 mmhos/cm standard in April increases from approximately 5 percent under existing conditions to approximately 35 percent under Alternative 4, with other months showing similar changes.
58	EIR/EIS Appendix 8M	Section 3.1	Appendix 8M section 3.1 states that discharges from point sources in North San Francisco Bay (i.e., refineries) that contribute selenium to Suisun Bay and the western Delta are expected to be reduced through a TMDL under development by the San Francisco Bay Regional Water Quality Control Board that is expected to result in decreasing discharges of selenium. The EIR/EIS should not presume the outcome of a

			TMDL that has not been completed or adopted by the San Francisco Bay Regional Water Quality Control Board. Potential increases in upstream discharges of selenium associated with alternatives proposed in the EIR/EIS should be addressed by the project independent of the outcome of the TMDL currently under development. Increases in upstream discharge of selenium are a concern for downstream water quality.

Implementing Agreement Specific Comments

	Chapter/ Appendix	**Page/Line # or Section**	**Comment**
59	IA	1.0 Page 1	The Draft Implementing Agreement makes the following statement: "The United States Bureau of Reclamation (Reclamation) of the United States Department of the Interior is not a Party to this Agreement. References to Reclamation's roles and responsibilities in this Agreement reflect those as set forth in the BDCP. There are no obligations on behalf of Reclamation established in this Agreement." It is not clear from reading the BDCP n EIR/EIS what, if any, role USBR will have in the BDCP process. This should be clarified. The EIR/EIS should clearly describe the various approvals both DWR and USBR will need for the BDCP from the Water Boards and disclose any impacts and appropriate mitigation measures.
60	IA	10.2.1.1 Page 25	The review process referred to in Section 15.8 refers to BDCP Chapter 7, Table 7-1 to determine which agency has final decision making authority. Table 7-1 doesn't specifically address the Decision Tree process which does not change a conservation measure but instead results in the selection of one of the alternatives provided by the conservation measure. The document should state which agency has final decision making authority with respect to the Decision Tree process.
61	IA	10.2.1.2 Page 26, 10.2.2.2.2 Page 28, 10.3 and 10.4	The data and other information devolved through the Decision Tree adaptive management, and real time operations processes should be made readily available to the public to facilitate independent analysis and evaluation. Raw data should be included, and documentation of QA/QC processes should be clear and complete. Methods of analysis should be

			documented clearly so that analyses are reproducible. We recommend coordination with the California Water Quality Monitoring Council and Delta Science Program to ensure that data sharing is consistent with emerging community standards.
62	IA	10.2.1.2 Page 26	Step 3, part (iii) of the Decision Tree process provides that the Implementing Office will administer the process of interpreting the scientific results of the process and identifying a course of action with respect to the alternatives. The document should state what standards or risk assessment processes will be used to interpret the results and formulate the decision.
63	IA	9.5 Page 22	The document should define the terms “future plan or project”. Also, the term “Permittee” is defined in IA 3.46 and conflicts with the usage here.
64	IA	10.2.1 Page 24	The Implementing Agreement includes a discussion of Real-Time Operations, the Decision Tree Process and Adaptive Management. This discussion does not mention of the State Water Board’s continuing authority over the State Water Project and Central Valley Project water right permits as well as the ongoing periodic review process to update the Bay-Delta Water Quality Control Plan that may result in additional requirements set outside of the BDCP processes described here. A statement to this effect should be included in the document.
65	IA	10.2.2.1 Page 27	The third bulleted item states that real-time operations will be used to “maximize conservation benefits to covered fish species and maximize water supplies.” In contrast, BDCP Chapter 3.4.1.4.5, page 3.4-26, line 16 states that real-time operations will maximize water supply for SWP and CVP … subject to providing the necessary protections for covered species.” The two documents should be edited to harmonize the potentially conflicting goals.
66	IA	10.2.2.2.3 Page 28	The IA states that “[a]bsent concurrence of the relevant agency directors, the disputed real-time operational adjustment will not be made.” The agency directors in the IA include the director of CDFW, the regional directors of the relevant federal fish and wildlife agencies, the director of DWR, and the regional director of USBR. In contrast, BDCP Chapter 3.4.1.4.5, page 3.4-27, line 28 states that “the decision will be made by the Regional Director of the relevant fish agency(s),

			given that the Directory of the project agency concurs that the change is within their authority." This is also stated in Table 7-1. Both documents should be consistent.
67	IA	10.2.2.2.3 Page 28	The document should state how technical and jurisdictional issues will be resolved given that a real-time operational adjustment will not be made where there is no concurrence of the relevant agency directors.
68	IA	10.2.2.3 Page 28	The document should clearly define the term "specific parameter." The term parameter is used in many different ways in BDCP 3.4.1.4.
69	IA	10.3.4	The document should clearly define the term "process" as it is used in multiple ways in the IA and its use with respect to the Adaptive Management Programs needs to be explicitly stated where the term occurs to eliminate ambiguity. For example, "AMP decision making process."
70	IA	10.3.5.1.2 Page 34	The document should clearly define what the term "adaptive resources" means.
71	IA	10.3.7.1 Page 36	The document should be corrected. The parties' commitments to funding the Supplemental Adaptive Management Fund are not specified in Chapter 8.
72	IA	10.3.7.2 Page 37	The document should describe the resources to be shared and the process for sharing the resources that are included in the second bulleted item.
73	IA	11.4.2.1 Page 43	The Adaptive Management Team should be involved in the process of evaluating the effectiveness of the Reserve Management Plan and revising the plan as necessary.
74	IA	13.1.1 Page 46	The document should clearly state the Authorized Entities' share of the cost of the Supplemental Adaptive Management Fund and the Supplemental Resources Fund as those values are not stated in the BDCP.
75	IA	15.2.4.4	The document should be edited to harmonize this section with section 10.2.1.1, BDCP Chapter 3.6.3.5.1, and BDCP Chapter 7 as there are many conflicts between roles and appeals processes. The implementation of water operations in CMs is treated differently than the non-water operation sections of

			CMs in Chapter 7. The Decision Tree process has different rules. Finally, non-water operation sections of CMs prior to the end of the Decision Tree process are inadequately described. The document needs to be edited to clearly describe those sections.
76	IA	16.3.2	The document should clearly state how operations prior to the time that the NDDss become operational will be reported.
77	IA	22.0 Page 80	The document should define the term “non-participating”.
78	IA	22.6 Page 84	The last sentence of this section assumes that the Permittees will invoke the review process provided in section 15.8 but does not address the situation in which the Permittees do not invoke the review process. This sentence in the document should be modified to address this potential circumstance.

BDCP Plan General Comments

	Chapter/ Appendix	**Page/Line # or Section**	**Comment**
79	BDCP Chapter 5	General	The BDCP effects analysis process(which presumably carries over to the similar qualitative judgments in the EIR/EIS) appears to potentially misinterpret the coding of ranked data with numbers instead of letters as converting qualitative data to quantitative data (page 5.5-1, line 20). This issue appears to be further compounded by performing mathematical operations on the numerical codes for the ranked data as if the coded scores were quantitative ratio scale data. Please address.
80	BDCP 5	5.5.3-33 Line 19	In contrast to the BDCP Effects conclusion that there is generally limited change in physical attributes in upstream areas except for the Feather River (see Figure 5.5.3-4, page 5.5.3-43), the EIR/EIS found that the effect could not be determined (EIR/EIS ES-73, AQUA-43). Which is correct?

81	BDCP Chapter 6	6.4.2.2.4	Neither this section nor the modeling sections referred to in this section clearly describe how a drought is defined for purposes of defining changed and unforeseen circumstances. While the frequency and inflow standards (75% of median) are clear it is not clear how the median is calculated using the models. It appears that a drought may be defined differently than the current river index methods and that operations upstream of the rim dams may be included in the modeling. Please clearly state how modeling of drought conditions was conducted in the BDCP document.
82	BDCP Chapter 6	6.4.2.2.4	Is the median inflow defined differently for each of the Alternative Actions? Is the median inflow defined differently for each of the four scenarios (H1, H2, H3, H4) of Alternative 4, the preferred project? Please clearly state how median inflow is defined for each of the alternatives and scenarios in the document.
83	BDCP Chapter 6	6.4.2.2.4	Please state in the document (a table would be ideal) which of the BDCP Natural Communities are aquatic natural communities and which are terrestrial communities in the context of changed and unforeseen circumstances.
84	BDCP Chapter 6	6.4.3	Please clearly state in the document how drought conditions are defined and calculated for each of the action alternatives.
85	BDCP Chapter 6	6.4.3	Please clearly state in the document how median inflow will be calculated to determine if unforeseen drought circumstances exist during the ten-year Decision Tree period if Alternative 4 is adopted and none of the four scenarios (H1, H2, H3, H4) will be chosen until the end of the ten-year period.
86	BDCP Chapter 6	6.4.3	How is climate change incorporated into the calculation of inflow for purposes of calculating the median inflow to determine that unforeseen drought circumstances are impacting an aquatic natural community? Is the comparison between the NAA or Baseline Conditions versus the Action Alternative with climate change at year 2060 or the Action Alternative with climate change at the end of each water year? Please clarify and please clearly state in the document how climate change in incorporated and calculated for each of the action alternatives.

87	BDCP Chapter 6	6.4.3	The meaning of the phrase “original terms of the Plan” in the third bulleted item is ambiguous. The document should clearly define what this phrase means and provide examples of original terms.

BDCP Plan Specific Comments

	Chapter/ Appendix	**Page/Line # or Section**	**Comment**
88	BDCP 3	3.4.1.4.5	Please describe how it will be possible to adequately test the alternative hypotheses of the Decision Tree within the 10-year time period especially if there is an inadequate representation of water year types and replicate conditions and habitat restoration during that time period? It appears that 10 years may be too short of a time period to assure that adequate data will be collected to dictate operational requirements for the following approximately 40 year period within the narrow range included in the Decision Tree process. As stated in previous comments, the State Water Board must make an independent determination of water project, water quality and other requirements needed to reasonably protect beneficial uses. Those requirements are subject to regular review and modification and as such may not conform to the proposed BDCP process.
89	BDCP 3	3.4.1.4.5	As stated above with regard to the IA, the data and other information devolved through the Decision Tree adaptive management, and real time operations processes should be made readily available to the public to facilitate independent analysis and evaluation. Raw data should be included, and documentation of QA/QC processes should be clear and complete. Methods of analysis should be documented clearly so that analyses are reproducible. We recommend coordination with the California Water Quality Monitoring Council and Delta Science Program to ensure that data sharing is consistent with emerging community standards.
90	BDCP 3	3.4.1.4.5	We suggest adding an introductory paragraph clarifying the language and organization for this section.
91	BDCP 3	3.4.1.4.5	CM2 should be referenced in most of the discussion as Fremont Weir operations are included in this section.

92	BDCP Appendix 5C.4.5.2.1	5C.4-118 Line 24	Delta Smelt Abiotic Habitat Index. There are numerous statements critical of the results of Feyrer and coauthors (2011) including a comment that the actual habitat requirements of Delta smelt are more complex than X2. That complexity is actually acknowledged by Feyrer and coauthors (2011). The authors' approach was designed to be a scenario analysis to investigate the potential effects of climate change on Delta smelt physical habitat. That type of climate change analysis is difficult to accomplish even using data restricted to the physical environment as was found to be the case during BDCP modeling of HSI (BDCP Appendix 5E) where turbidity could not be modeled but was instead held constant. The statement that "[i]t is unclear what portion of that fractional variance is actually due to turbidity, rather than salinity" appears to contain three errors. GAMs compute estimates of deviance not variance and Secchi depth and specific conductivity were analyzed not turbidity and salinity.
93	BDCP Appendix 5C	4-24 Line 4	The statement that immigration, spawning, and emigration for winter-run Chinook is assumed to be December through August appears to be incorrect as these life stages occur over the entire year.
94	BDCP Appendix 5E	38	A single monthly temperature and salinity value was used for each ROA to model the Habitat Suitability for each fish species. How does this accurately represent the known variability of Delta smelt habitat?
95	BDCP Appendix 5E	40 Line 43	Turbidity was held constant. How does this accurately represent the known variability of Delta smelt habitat?
96	BDCP Appendix 5E	41 Line 23	The extent of physical habitat used in the analysis is the maximum available acreage without consideration of potential constraints of limited tidal energy. This should be noted in the analysis.

97	BDCP Appendix 5E	95 Line 27	The document states that: "The decrease in HSI for the egg-larvae stage is the result of increased water temperatures in the subregion by the LLT primarily due to climate change impacts. There was almost no change in the HSI value for temperature over the period due to covered activities alone reflecting the lack of impact of the BDCP on temperature in Cache Slough (Figure 5.E.4-40). It is unclear from this analysis if the overall increase in HUs as a result of CM4 compensates for the decline in habitat suitability related to increasing temperatures for spawning delta smelt in Cache Slough." Please provide data to support this conclusion. While Figure 5.E.4-40 shows that BDCP does not affect temperature it does not provide data regarding water temperature increases due to climate change. It does show that BDCP will cause increases in salinity in 3 out of the 5 water-year types.